REMARKS

Claims 56-63, 65-77, and 79-88 are currently pending in the present application, including independent claims 56, 76, and 84. Independent claim 56, for instance, is directed to a breathable film comprising a blend of a thermoplastic polymer, a filler, and silica nanoparticles. The silica nanoparticles have a diameter of less than about 500 nanometers and a negative first Zeta Potential from about -1 to about -50 millivolts. The silica nanoparticles are modified with a metal ion to form modified silica nanoparticles. The modified silica nanoparticles comprise a second Zeta Potential being at least about 5.0 millivolts higher than the negative first Zeta Potential.

Claim Rejections – 35 U.S.C. § 103

In the Office Action, claims 56-63, 65-73, and 84-87, including independent claims 56 and 85 were rejected under *35 U.S.C. § 103(a)* as being unpatentable over U.S. Patent App. 2002/0004350 to Morman et al. in view of U.S. Patent App. 2002/0151634 to Rohrbaugh et al. Rohrbaugh et al. is directed to coating compositions comprising nanoparticle systems. The coating composition is to be used on soft surfaces such as fabrics, garments, textiles, and films. ¶ [0025]. The coating includes nanoparticles dispersed in a carrier. The nanoparticles are preferably layered clay materials, but can be inorganic metal oxides. ¶ [0046]. Rohrbaugh et al. discloses that the inorganic metal oxides "may be silica- or alumina-based nanoparticles that are naturally occurring or synthetic." ¶ [0061]. Furthermore, the nanoparticles may be "functionalized." Inorganic salts of Cu^{+2} are among the functionalized surface molecules reported as possibilities. ¶ [0069].

Thus, Rohrbaugh et al. is cited as allegedly disclosing Applicants' claimed nanoparticles and modified nanoparticles. Additionally, the Office Action asserts that it

would be obvious to combine Morman et al. with Rohrbaugh et al. to yield Applicants' claimed invention. Applicants respectfully disagree.

Independent claim 56 requires silica nanoparticles with a negative first Zeta Potential from about -1 to about -50 millivolts and, upon modification with a copper ion, a second Zeta Potential at least 5.0 millivolts higher than the first Zeta Potential. Rohrbaugh et al. fails to teach or suggest such a limitation. In an attempt to obviate this limitation, the Examiner points to paragraph [0049] of Rohrbaugh et al. that states that "a sheet of an expandable layer silicate has a negative electric charge, and the electric charge is neutralized by the existence of alkali metal cations and/or alkaline earth metal cations." First, Applicants reiterate their previous arguments that "silicate" may not be equated with silica (SiO_2). In contrast, one skilled in the art appreciates that silicates are typically charged compounds (e.g., the most widely utilized silicate is SiO_4^{-2}). This is consistent with Rohrbaugh et al.'s disclosure that the sheet of silicate has a negative charge.[1] Second, even if silicate were equated with silca, Applicants claim a metal ion selected from copper ion, silver ion, gold ion, iron ion, and combinations thereof. In stark contrast, Rohrbaugh et al. discloses neutralization with alkali metal cations (Group 1 metals: Li^{+1}, Na^{+1}, K^{+1}, Rb^{+1}, Cs^{+1}, and Fr^{+1}) and/or alkaline earth metal cations (Group 2 metals: Be^{+2}, Mg^{+2}, Ca^{+2}, Sr^{+2}, Ba^{+2}, and Ra^{+2}). Copper, silver, gold, and iron, on the other hand, are transition metals as appreciated by those skilled in the art.

As such, Rohrbaugh et al. fails to teach or suggest that the silca nanoparticles disclosed comprise a first Zeta Potential from about -1 to about -50 millivolts and, upon modification with a copper ion, a second Zeta Potential at least 5.0 millivolts higher than

[1] Note, Applicants are aware that the Examiner has cited art in which she believes electrical charge is equated with zeta potential. Applicants will address that assertion below.

the first Zeta Potential. Regarding the first Zeta Potential, Applicants disclose that one embodiment of silica nanoparticles that meet such a limitation is available from Nissan Chemical Industries under the brand name Snowtex®. To establish inherency, the evidence must make clear that the missing descriptive matter is *necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. The mere fact that a certain thing *may* occur or be present in the reference is not sufficient. MPEP § 2163.07(a).

Furthermore, independent claims 56, 76, and 84 require that the film comprises filler <u>blended</u> with the nanoparticles. For instance, Applicants disclose one embodiment wherein the filler, nanoparticles, and metal are combined in an aqueous solution. The solution is then dried to create a cake to be coextruded with the thermoplastic polymer (claim 88). In stark contrast, <u>Rohrbaugh et al.</u> discloses a <u>coating</u> for surface coating soft surfaces such as fabrics, garments, textiles, and films. Applicants respectfully submit that one skilled in the art would not <u>blend</u> filler components (e.g., calcium carbonate (claim 62)) with the nanoparticles from the coating of <u>Rohrbaugh et al</u>.

Additionally, Applicants note that there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. Applicants respectfully submit that one skilled in the art would not look to the disclosure of <u>Rohrbaugh et al.</u> and attempt to combine with <u>Morman et al.</u> in the manner suggested in the Office Action. As a preliminary matter, <u>Morman et al.</u> is directed to a film with preferential stretch capabilities. <u>Morman et al.</u> contains no disclosure, suggestion, or any desire to construct a film with odor control properties. Additionally, Applicants note that each independent claim requires that the nanoparticles are <u>**blended**</u> with the filler. <u>Rohrbaugh et al.</u> contains no teaching or suggestion to modify the coating in order to

blend with elements such as calcium carbonate, clays, talc, zeolites, diatomaceous earth, kaolin, mica, carbon, chitin etc. Plainly, the Examiner's only incentive or motivation for so modifying Morman et al. using the teachings of Rohrbaugh et al. in the manner suggested in the Office Action results from using Applicant's disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings in the prior art, which is improper under 35 U.S.C. § 103. Accordingly, it is respectfully submitted that any such modification of the cited references relies on the impermissible use of hindsight, which cannot be successfully used to support a *prima facie* case of obviousness.

Additionally independent claim 76 was rejected *35 U.S.C. § 103(a)* as being unpatentable over Morman et al. in view of Rohrbaugh et al. and further in view of U.S. Patent App. 2001/0051189 to Fernandez et al. Fernandez et al. is cited as allegedly disclosing nanoparticles comprising a positive Zeta Potential as claimed by Applicants in independent claim 76. First, Applicants restate their arguments with respect to independent claims 56 and 84 above. Fernandez et al. does not remedy these deficiencies. Second, Applicants respectfully submit that Fernandez et al. fails to disclose nanoparticles comprising a positive Zeta Potential from about 1 to about 70 millivolts.

First, Applicants again respectfully note that there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. Fernandez et al. is directed to pharmaceutical compositions. Applicants respectfully submit that one of ordinary skill in the art would not look to pharmaceutical compositions useful for the delivery of high molecular weight compounds (see ¶ [0010]) in order to control odor in personal absorbent articles. Again, Applicants respectfully

submit that the Examiner's only incentive or motivation for so modifying Morman et al. and Rohrbaugh et al. using the teachings of Fernandez et al. in the manner suggested in the Office Action results from using Applicant's disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings in the prior art, which is improper under 35 U.S.C. § 103. Accordingly, it is respectfully submitted that any such modification of the cited references relies on the impermissible use of hindsight, which cannot be successfully used to support a *prima facie* case of obviousness.

At any rate, Fernandez et al. discloses nanoparticles with a positive electrical charge. Applicants respectfully submit that electrical charge may not be equated with Zeta Potential. For instance, as noted in Applicants' specification:

> Nanoparticles are **not** generally ionic yet still have an overall electric Zeta Potential. "Zeta Potential" refers to the electrical potential, or electrokinetic potential, that exists across the interface of all solids and liquids. Naturally occurring chemical reactions on the surface of a nanoparticle result in the Zeta Potential of that nanoparticle and nanoparticles may have either positive or negative Zeta Potentials. Silca nanoparticles, for example, are tetrahedral complexes of silicon dioxide molecules. On the surface of the silica particles the silicon dioxide molecules can undergo chemical reactions forming silanol groups (SiOH) which react with other silanol groups to form siloxane bonds (Si-O-Si). The dehydration reactions of the silanol groups to form the silanol bond and the reverse reactions result in a negative Zeta Potential and allow positively charged metal ions to adsorb onto the silica. Pg. 11, line 30 – pg. 12, line 14.

As such, the disclosure of Fernandez et al. of nanoparticles with a positive electrical charge may not be said to anticipate nanoparticles comprising a Zeta potential between about 1 and about 70 millivolts.

In response to this argument, the Examiner cites Edwards which indicates that zeta potential is the "effective electrical charge." Applicants respectfully assert that "effective electrical charge" is not ionic charge as asserted by Examiner. The following

figure available at http://www.scielo.br/img/fbpe/aabc/v74n4/a07fig02.gif helps to illustrate what zeta potential is.

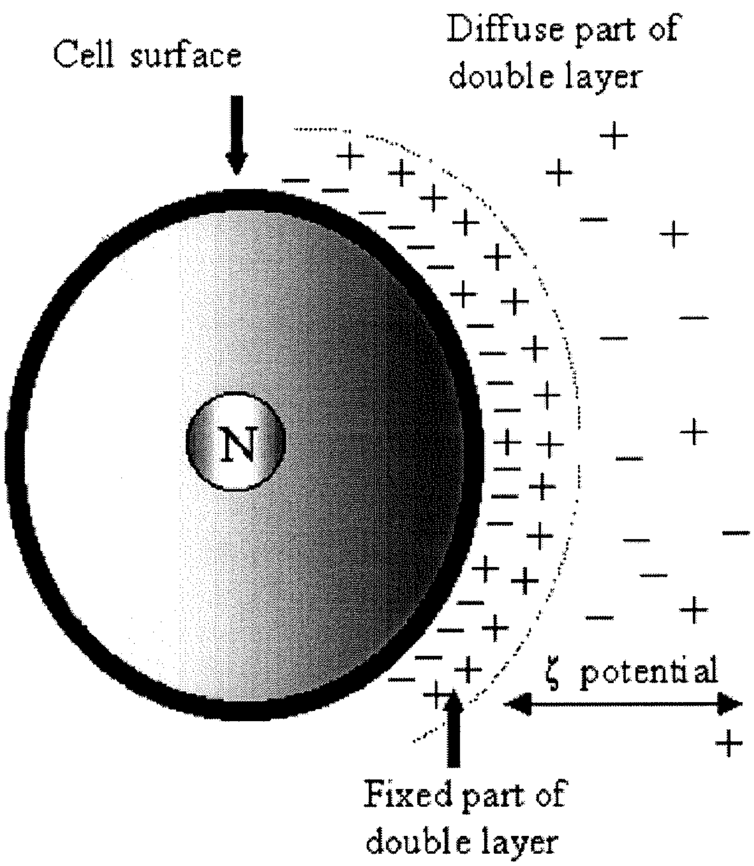

Fig. 2 - - The surface charge of a particle or cell influences the distribution of nearby ions in the polar medium. Ions of opposite charge (counter-ions) are attracted towards the surface and ions of like charge (co-ions) are repelled away from the surface. This leads to the formation of an electric double layer made up of the charged surface and a neutralizing excess of counter-ions over co-ions distributed in a diffuse manner in the polar medium. The electric double layer can be regarded generally as consisting of two regions: an inner or fixed region which may include adsorbed ions and a diffuse region in which ions are distributed according to the influence of electrical forces and random thermal motion. Electrokinetic or ζ (zeta) potential is measured on an imaginary plane (Stern plane) between the fixed part of double layer and the electrolyte solution (diffuse part of double layer).

Thus, the zeta potential is the electrokinetic potential not the ionic charge.

Regardless, even if zeta potential were equated and the Examiner's inherency arguments were proper[2], the references still fail to yield the limitations of claim 76. Claim 76, as amended, requires that the modified nanoparticle has a second Zeta Potential of at least 5.0 mV less than the first Zeta Potential. One skilled in the art appreciates that none of the positive ions disclosed in the cited references could yield such a limitation.

Thus, Applicants submit that independent claims 56, 76, and 84 define over the references either alone or any in proper combination. Furthermore, Applicants respectfully submit that, at least for the reasons indicated above, the dependent claims 57-63, 65-75, 77-83, and 85-88 also patentably define over the reference(s) cited. The patentability of the dependent claims, however, certainly does not hinge on the patentability of the independent claims. For instance, claim 88 requires that the breathable film is formed by coextruding said thermoplastic polymer with said blend of filler and silica nanoparticles. None of the references disclose or suggest such a limitation.

Double Patenting

As a final matter, the provisional rejection of various claims over co-pending Application No. 10/686,933 for obviousness-type double patenting is noted. Additionally, the rejection of various claims over U.S. Patent No. 7,141,518 for nonstatutory obviousness-type double patenting is noted. Applicants agree to submit terminal disclaimers for the above references, if necessary, at a time when the present application is otherwise in condition for allowance.

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[2] Applicants submit that inherency of a Zeta Potential of 1 to 70 mV is improper for the reasons noted above.

In summary, Applicants respectfully submit that the present application is in complete condition for allowance and favorable action, therefore, is respectfully requested. Examiner Sasan is invited and encouraged to telephone the undersigned, however, should any issues remain after consideration of this Amendment.

Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully requested,

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